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Sequence IIIF Information Letter 01-1
Sequence No. 4
September 18, 2001

ASTM consensus has not been obtained on this Information Letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Sequence IIIF Mailing List

SUBJECT: Elimination of Condenser Coolant Flow as QI Parameter
Elimination Of New Oil Addition At End Of Test
Revised Condenser Part Number
Revised Parts Cleaning Material Part Number
Revised Dipstick Calibration Curve
Revised MRV & CCS Procedures
Revised Viscosity Increase Calculation Procedures
Revised QI U&L Values for Engine Speed & Condenser Coolant Out Temperature

This Information Letter implements action items approved by the Sequence IIIF Surveillance Panel. This Information Letter addresses specific parts and procedures pertaining to quality, consistency, performance, and accountability of test parts as part of the ongoing effort by the panel to ensure continual process improvement of the Sequence IIIF test. Updated sections of the Sequence IIIF Test Procedure Draft are attached.

Elimination of Condenser Coolant Flow as QI Parameter

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to eliminate Condenser Coolant Flow as a QI parameter. The flow is still to be targeted at the same flow rate, as before, however QI calculations are no longer required on this parameter. This change is effective for all tests started on or after May 23, 2001.

Elimination Of New Oil Addition At End Of Test

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to eliminate the final new oil addition at the end of test. This was done so that the entire final oil drain would be usable for chemical analysis, instead of being diluted with new oil and rendered useless for analytical testing. This change is effective for all tests started on or after May 23, 2001.

Revised Condenser Part Number

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to revise the condenser part number in the Sequence IIIF Test Procedure. The current part number listed in the Test Procedure is incorrect and does not reflect the condenser currently in use in industry. The new part number reflects the part that is currently in use for all Sequence IIIF testing in industry. This change is effective for all tests started on or after May 23, 2001.

Revised Parts Cleaning Material Part Number

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to incorporate a new part number for the *Natural Orange* soap used in the "dishwasher-type" parts cleaning machine for cleaning Sequence IIIF test parts. This new part number is for the same material that is currently used in Sequence IIIF testing and as such does not reflect a change in test operations. Both the old and the new part numbers are considered acceptable materials for cleaning Sequence IIIF test parts. This change is effective for all tests started on or after May 23, 2001.

Revised Dipstick Calibration Curve

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to incorporate the Dipstick Calibration Curve developed by OH Technologies, Inc. into the Sequence IIIF Test Procedure. This curve is used to determine oil level in a Sequence IIIF test engine when using the required test dipstick. This change is effective for all tests started on or after May 23, 2001.

Revised MRV & CCS Procedures

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to revise the procedures for conducting Mini Rotary Viscometer (MRV) and Cold Crank Simulator (CCS) tests on used oil samples in the Sequence IIIF test. These new requirements eliminate the MRV and/or CCS requirements on certain used oil samples and also further define how to conduct these two analytical tests on the used oil samples. This change is effective for all tests started on or after May 23, 2001.

Revised Viscosity Increase Calculation Procedures

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to revise the procedures used for viscosity increase calculations on tests with very low (less than zero percent) or very high (greater than 8000 centistokes) viscosity increase results. These revisions set a lower limit of 0.1% on percent viscosity increase and an upper limit of 8000 cSt for the kinematic viscosity of the used oil. In other words, the reported percent viscosity increase can be no lower than 0.1% and the kinematic viscosity increase can be no larger than 8000 cSt for any Sequence IIIF test result. This change is effective for all tests started on or after May 23, 2001.

Revised QI U&L Values for Engine Speed & Condenser Coolant Out Temperature

At the May 23, 2001 meeting of the Sequence IIIF Surveillance Panel the panel approved a motion to reset the QI U&L Values for Engine Speed and Condenser Coolant Out Temperature based upon the operational data for tests "CMIR 52" and "CMIR 59c1" respectively, which were presented at the meeting. The panel did not review the new U&L values; only the operational data plot was reviewed and approved. The new U&L values were then to be calculated by the TMC from these operational data files such that these tests would generate a QI result of zero. The U&L Values would also be rounded, if necessary, to an appropriate precision level. Both operational plots had generated QI results only slightly below zero and when new limits were calculated from these data files and then rounded in the same manner as the previous U&L values had been rounded, the resulting new U&L values were found to be the same as those currently in effect.

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Attachments

c: ftp://tmc.astm.cmri.cmu.edu/docs/gas/sequenceiii/procedure_and_ils/IL01-1.pdf

1.4 This test method is arranged as follows:

Annexes

Appendixes

6.9 Condenser Cooling System- Contained in the Fluid Conditioning Module, supplies non-pressurized coolant at a flow rate of 10 L/min (2.64 gal/min) temperature controlled at 40°C (104°F) at the condenser outlet. The system incorporates the following features: condenser heat exchanger, OHT3F-075-1[16]: condenser adapter fitting, pump, magnetic-type flow meter, flow control and three-way control valves, external heating and cooling systems, and low-point drains. The system integrates with the test stand data acquisition and control computer for process control and maintains the specified coolant temperature and flow.

10.5.3.1 The block should be cleaned in a heated bath or temperature controlled automated parts washer before and after honing. Follow the suggested guidelines as listed below to ensure there is no oxidation flash over of the engine block after this process.

1) Use only NAT-50 or PDN-50 soap at a concentration of 16 pounds of soap per 100 gallons of water.

2) Set the temperature of the water to 140 degrees F.

3) Do not pre-condition the water that is being used in any way.

4) Prior to installing the engine in the parts washer, ensure that all coolant passages are blocked off to prevent cleaning solutions from entering the passages.

5) Allow the block to run through the cleaning cycle for a period of 30 to 40 minutes.

6) After the cycle is complete, immediately remove the block from the washer and spray it down with stoddard solvent.

7) Wipe cylinder bores out with a lint free towel.

8) Spray engine block with a mixture of 50/50 EF-411 and stoddard solvent.

10.34 Condenser-Install a condenser mounting bracket OHT3F-041-1 and condenser OHT3F-075-1[16] with an adapter OHT3F-040-1 on the front of the engine using flexible hose to connect the adapter to the rocker cover bushings OHT3F-028-1.

12.8.6 Determine the oil level after the 15-min period, in mm, using the calibrated dipstick. See A3.

12.8.8 After each 10-h of the 80-h test, except at the end of test, add 59ml of new oil to replace the sample taken and also add 472 mL of new oil to the engine.

12.8.9 After each 10-h of the 80-h test, except at the end of test, add oil to the crankcase from the 472-mL purge sample to bring the oil level back to that following the initial run, as nearly as possible. Discard any excess purge sample. Record the results on Fig. A10.1.

13.12 End-of-Test Used Oil Sample Testing - Conduct a Cold-Cranking Simulator test (Test Method D5293) and a Mini Rotary Viscometer test (Test Method D4684) on the end-of-test (EOT) used oil sample with the exceptions that follow.

13.12.1 Run a Cold-Cranking Simulator (CCS) test (Test Method D5293) on the end-of-test (80 hour) drain at successively higher temperatures until you obtain a passing result using the table shown in SAE J300, Rev. DEC19991. The W-grade corresponding to the temperature required for a passing result will be considered the used oil passing viscosity grade. One grade less than the new oil viscosity grade is suggested as a starting point. Report the results on Form 6, Used Oil Analysis Results, in the standardized report form set (See A6).

13.12.2 Run the Mini Rotary Viscometer test (Test Method D4684), MRV-TP1, at the recommended temperature (based on the passing used oil CCS result) using the table shown in SAE J300, Rev. DEC1999[A]. Report the end-of-test Mini Rotary Viscometer test results as MRV Temperature in °C as follows. If a Yield Stress is obtained at the designated temperature, report the Yield Stress in Pa and note the Apparent Viscosity as not measured (NM). If a Yield Stress is not obtained at the designated temperature, report the Yield Stress as not measured (NM) and record the Apparent Viscosity in cP. Report the results on Form 6, Used Oil Analysis Results, in the standardized report form set (See A6).

13.12.3 If the % viscosity increase for the kinematic viscosity at EOT is higher than 500% (See 13.13), the Cold-Cranking Simulator and Mini Rotary Viscometer tests are not required. A notation is required in the Other Comments & Outliers section of Form 13 (See A6) indicating that the CCS and MRV were not run and enter not measured (NM) in the standardized report form set (See A6).

13.12.4 If the test oil is a straight-grade oil, the Cold-Cranking Simulator and Mini Rotary Viscometer tests are not required. A notation is required in the Other Comments & Outliers section of Form 13 (See A6) indicating that the CCS and MRV were not run and enter not measured (NM) in the standardized report form set (See A6).

13.12.5 If the end-of-test used oil sample fails the Cold Cranking Simulator test at -10°C, the Mini Rotary Viscometer (MRV) test is not required. A notation is required in the Other Comments & Outliers section of Form 13 (See A6) indicating that the MRV was not run because the EOT drain did not meet the -10°C CCS requirements. Enter not measured (NM) in the standardized report form set (See A6) for the MRV measurement.

[A] SAE J300, Engine Oil Viscosity Classification, December 1999. {Footnote will be given an appropriate number when this section is incorporated into the Sequence IIIF Test Method.}

13.13.8 Calculation instructions for special cases related to % Viscosity Increase

13.13.8.1 Instructions for calculating and reporting results if the Final Original Units Result on Form 4 (See A6) for % Viscosity Increase is zero or negative.

13.13.8.1.1 The minimum result considered for the % Viscosity Increase will be 0.1%. Substitute 0.1 for the original unit result and complete the calculations on form 4 (See A6). A notation is required in the Other Comments & Outliers section of Form 13 (See A6) indicating that the Original Units Result has been modified for a special case.

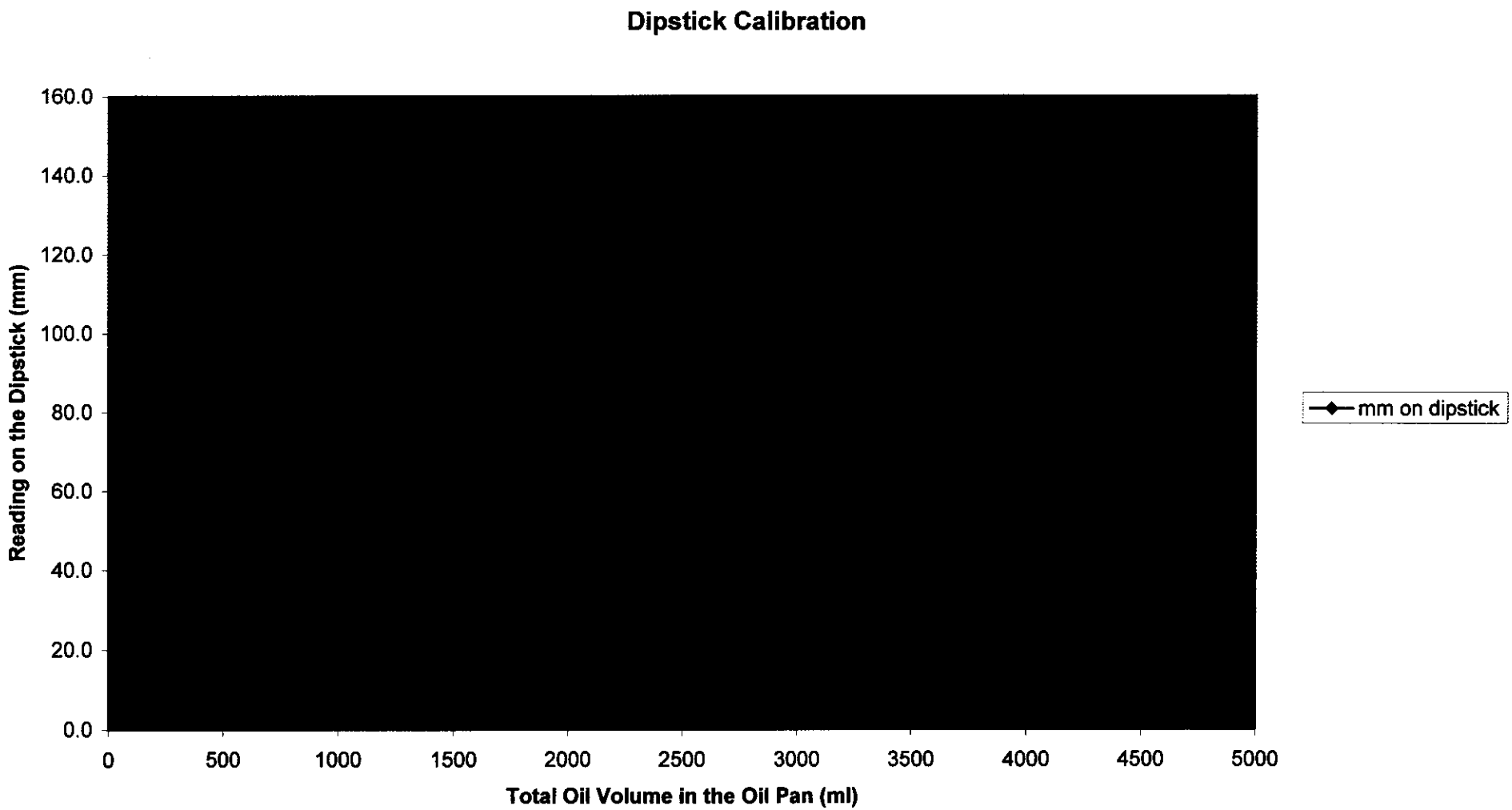
13.13.8.2 Instructions for calculating and reporting results if the Viscosity Result on Form 6 (See A6) for Viscosity Increase Data is Too Viscous to Measure (TVTM).

13.13.8.2.1 The maximum kinematic viscosity result reported will be 8000 cSt using either equipment noted in 13.13.3, use a tube size of 500 or less. If the measured viscosity is 8000 cSt using tube size 500, this will be considered the maximum reportable viscosity. Report 8000 cSt on Form 6 (See A6) for entry in the column listed as Viscosity. This value will be used to do the calculations for Change and Percent. (This will provide consistent

TVTM data for reporting purposes and it also expands the maximum viscosity to fill the space allowed by the data dictionary.)

13.13.8.2.2 Complete the calculations on Form 4 (See A6) for % Viscosity Increase using the Percent Value for the final drain from Form 6 except that the Severity Adjustment (SA) displayed and used for % Viscosity Increase calculations will be set to zero (0). A notation is required in the Other Comments & Outliers section of Form 13 (See A6) indicating that the Severity Adjustment has been modified for a special case.

A3. SEQUENCE IIIF ENGINE OIL DIPSTICK CALIBRATION CURVE



ml total	mm on dipstick
500	
1000	
1476	148.0
1488	147.5
1500	147.0
1518	146.5
1536	146.0
1554	145.5
1572	145.0
1590	144.5
1608	144.0
1626	143.5
1644	143.0
1662	142.5
1680	142.0
1698	141.5
1716	141.0
1734	140.5
1752	140.0
1770	139.5
1788	139.0
1806	138.5
1824	138.0
1842	137.5
1860	137.0
1878	136.5
1896	136.0
1914	135.5
1932	135.0
1950	134.5
1968	134.0
1986	133.5
2004	133.0
2020	132.5
2036	132.0
2052	131.5
2068	131.0
2084	130.5
2100	130.0
2116	129.5
2132	129.0
2148	128.5
2164	128.0
2180	127.5

ml total	mm on dipstick
2276	124.5
2292	124.0
2308	123.5
2324	123.0
2340	122.5
2356	122.0
2372	121.5
2388	121.0
2404	120.5
2420	120.0
2436	119.5
2452	119.0
2468	118.5
2484	118.0
2500	117.5
2516	117.0
2533	116.5
2550	116.0
2567	115.5
2584	115.0
2601	114.5
2618	114.0
2635	113.5
2652	113.0
2669	112.5
2686	112.0
2703	111.5
2720	111.0
2737	110.5
2754	110.0
2771	109.5
2788	109.0
2805	108.5
2822	108.0
2839	107.5
2856	107.0
2873	106.5
2890	106.0
2907	105.5
2924	105.0
2941	104.5
2958	104.0
2975	103.5
2992	103.0

ml total	mm on dipstick
3094	100.0
3111	99.5
3128	99.0
3145	98.5
3162	98.0
3179	97.5
3196	97.0
3213	96.5
3230	96.0
3247	95.5
3264	95.0
3281	94.5
3298	94.0
3315	93.5
3332	93.0
3349	92.5
3366	92.0
3383	91.5
3400	91.0
3417	90.5
3434	90.0
3451	89.5
3468	89.0
3485	88.5
3502	88.0
3519	87.5
3536	87.0
3553	86.5
3570	86.0
3587	85.5
3604	85.0
3621	84.5
3638	84.0
3655	83.5
3672	83.0
3689	82.5
3706	82.0
3723	81.5
3740	81.0
3757	80.5
3774	80.0
3791	79.5
3808	79.0
3825	78.5

ml total	mm on dipstick
3927	75.5
3944	75.0
3961	74.5
3978	74.0
3995	73.5
4012	73.0
4029	72.5
4046	72.0
4065	71.5
4084	71.0
4103	70.5
4122	70.0
4141	69.5
4160	69.0
4179	68.5
4198	68.0
4217	67.5
4236	67.0
4255	66.5
4274	66.0
4293	65.5
4312	65.0
4331	64.5
4350	64.0
4369	63.5
4388	63.0
4407	62.5
4426	62.0
4445	61.5
4446	61.0
4483	60.5
4502	60.0
4521	59.5
4540	59.0
4559	58.5
4578	58.0
4596	57.5
4614	57.0
4632	56.5
4650	56.0
4668	55.5
4686	55.0
4704	54.5
4722	54.0

ml total	mm on dipstick
4830	51.0
4848	50.5
4856	50.0
4884	49.5
4902	49.0
4920	48.5
4938	48.0
4956	47.5
4974	47.0
4992	46.5
5010	46.0
5028	45.5
5046	45.0
5064	44.5
5082	44.0
5101	43.5
5120	43.0
5139	42.5
5158	42.0
5177	41.5
5196	41.0
5215	40.5
5234	40.0
5253	39.5
5272	39.0
5291	38.5
5310	38.0
5329	37.5
5348	37.0
5367	36.5
5386	36.0
5405	35.5
5424	35.0
5443	34.5
5462	34.0
5481	33.5
5500	33.0

2196	127.0	3009	102.5	3842	78.0	4740	53.5
2212	126.5	3026	102.0	3859	77.5	4758	53.0
2228	126.0	3043	101.5	3876	77.0	4776	52.5
2244	125.5	3060	101.0	3893	76.5	4794	52.0
2260	125.0	3077	100.5	3910	76.0	4812	51.5

NOTE: SUPERCEDES FILE: 981110 iiifdiprwnote.xls Dated 11/10/98

Annex A9
Sequence IIIF Quality Index U&L Values
(Effective 5/23/01)

Controlled Parameters	Quality Index U&L Values	
	L	U
Speed	3595	3605
Load	199.02	200.98
Air-to-Fuel Ratio	14.87	15.13
Condenser Coolant Outlet Temperature	39.77	40.23
Engine Coolant Outlet Temperature	121.54	122.46
Oil Filter Block Temperature	154.58	155.42
Exhaust Back Pressure	5.92	6.08
Intake Air Pressure	0.041	0.059
Engine Coolant Flow	158.57	161.43

TEST CELL
OIL SAMPLE #

SEQ. IIIF OIL LEVEL & CONSUMPTION

TEST #
START DATE

OIL LEVEL AT END OF TIMING RUN ML

	INITIAL	TEST HOURS							EOT
	RUN	10	20	30	40	50	60	70	80	TOTAL
INITIAL FILL=5500 ML										
REMOVE 472ML PURGE SAMPLE										
REMOVE 472ML LEVELING SAMPLE										
REMOVE 236ML ANALYSIS SAMPLE										
REMOVE 59ML ANALYSIS SAMPLE										
REPLACE 472ML PURGE SAMPLE										
ADD 236ML TO REPLACE SAMPLE										
ADD 59ML TO REPLACE SAMPLE										
ADD 472ML NEW OIL										
OIL LEVEL AFTER DRAIN DOWN (ML)										
LEVELING SAMPLE ADDED (ML)										
LEVELING SAMPLE DISCARDED (ML)										
RESULTING DIPSTICK LEVEL (MM)										
COMPUTED OIL LEVEL ML										
PERFORMED BY										

OIL CONSUMPTION ML

TOTAL NUMBER 472ML NEW OIL ADDITIONS - TOTAL SAMPLE DISCARDED + LEVEL @ EOT + 236ML = TOTAL CONSUMED